

Introduction to C++: COMP 322 (Winter 2014) - Quiz #2

Name:

ID:

Instructions

This is a *closed book* quiz. There are seven questions on 4 pages, for a total of 20 points.

In the code fragments, assume that the context (e.g. appropriate header files and `using namespace` statements) has been specified correctly.

When asked what a code fragment would print, don't worry too much about whitespaces and newlines. I care about the output numbers, and not about formatting.

Problem 1 (3 pts)

What would the following piece of code print?

```
class A {
public:
    void f() { cout << "A::f" << endl; }
    virtual void g() { cout << "A::g" << endl; }
};

class B : public A {
public:
    void f() { cout << "B::f" << endl; }
    void g() { cout << "B::g" << endl; }
};

int main()
{
    A a1;
    B b;
    A a2 = b;
    B* bp = new B;
    A* ap = bp;

    a1.f();
    a2.f();
    ap->f();
    a1.g();
    a2.g();
    ap->g();
}
```

Problem 2 (3 pts)

What would the following piece of code print?

```
class A {
public:
    int z; string name;
    A(string pName) : name(pName) { z = 3;}
    ~A() { cout << name << " " << z << endl; }
};

class B : public A {
public:
    B(string pName) : A(pName) { z = 7;}
    ~B() { cout << name << " " << z << endl; }
};

int main() {
    A a("a");
    B b("b");
}
```

Problem 3 (3 pts)

What will this piece of code print?

```
class A {
public:
    char *p;
    void f() {
        p = "a string";
        throw 13;
    }
    void g() { try { f(); p = "another string";}
    catch (int &e) {
        cout << "g:." << p << " " << e << endl;
    }
}
};

int main() {
    A a;
    try{ a.g(); }
    catch (int e) {
        cout << "MAIN:." << a.p << " " << e << endl;
    }
}
```

Problem 4(3 pts)

In the code provided for Problem 3 (see reverse), we missed the implementation of a destructor function. Please write a destructor that properly deallocates all data that should be deallocated.

Problem 5 (3 pts)

Given the following class relationships, only half of the numbered assignment statements are legal. Please list the numbers of the legal assignments in the space provided

```
class A { /* ... */ };
class B : public A { /* ... */ };
class C : public B { /* ... */ };
class D { /* ... */ };
class E : public D { /* ... */ };
```

```
int main() {
    A a; B b; C c; D d; E e;
    e=c; //1
    c=b; //2
    d=a; //3
    b=c; //4
    a=c; //5
    a=b; //6
}
```

Problem 6 (5 pts)

Answer the following FIVE questions with a short answer (1-2 sentences).

1. What is the difference between inheritance and polymorphism?

2. What is a try block?

3. What is the `this` pointer?

4. What is the `protected` keyword used for?

5. Explain what the purpose of throwing an exception would be.

Use the extra white space as you wish: